

SUPPLEMENTAL PRELIMINARY  
AMENDMENT AND  
REQUEST FOR INTERFERENCE  
UNDER 37 C.F.R. § 1.607(a)  
U.S. Appln. No. 09/662,181

**IN THE CLAIMS**

Add the following new Claims 56-65:

--56. A method for hydrophilifying the surface of a substrates comprising the steps of:  
providing a substrate coated with a solid layer having an interface with air, and  
containing a photocatalyst; and  
photoexciting the photocatalyst to permit molecules of water to be physically adsorbed  
onto the surface of said layer under the photocatalytic action of said photocatalyst, thereby  
hydrophilifying the surface of said substrate.

57. A method for hydrophilifying the surface of a substrate, comprising the steps of:  
providing a substrate coated with a solid layer having an interface with air, said layer  
containing a photocatalyst, and, at said interface, a hydrogen bond component,  $\gamma_s^h$ ; and  
photoexciting the photocatalyst to increase said hydrogen bond component under the  
photocatalytic action of said photocatalyst.

58. A method for hydrophilifying the surface of a substrate, comprising the steps of:  
providing a substrate coated with a solid layer having an interface with air, said layer  
containing a photocatalyst, and having, at said interface, a hydrogen bond component,  $\gamma_s^h$ ; and

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photoexciting the photocatalyst to increase said hydrogen bond component under the photocatalytic action of said photocatalyst, thereby accelerating the physical adsorption of molecules of water onto the surface of said layer.

59. A method for enhancing the oil repellency of the surface of a substrate in water, comprising the steps of:

providing a substrate coated with a solid layer having an interface with air, and containing a photocatalyst; and

photoexciting the photocatalyst to increase a hydrogen bond component, in the surface energy in the solid/gas interface of said layer under the photocatalytic action of said photocatalyst, thereby enhancing the oil repellency of the surface of the substrate when placed in water.

60. A method for cleaning a substrate, comprising the steps of:

providing a substrate coated with a solid layer having an interface with air, and containing a photocatalytic semiconductor material;

photoexciting the photocatalyst to enhance a hydrogen bond component,  $\gamma_s^h$ , in the surface energy in the solid/gas interface of said layer under the photocatalytic action of said


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photocatalyst, thereby enhancing the oil repellency of the surface of the substrate when placed in water; and

immersing the substrate in water or wetting the substrate with water to release an oil stain adhering on the surface of the substrate.

61. A composite with a hydrophilifiable surface, comprising:

a substrate;

 a solid layer provided on the surface of the substrate and having an interface with air, said layer containing a photocatalyst; and

a layer of molecules of water physically adsorbed onto the surface of said layer containing a photocatalyst in response to the photoexcitation of the photocatalyst.

62. A composite with a hydrophilifiable surface, comprising:

a substrate; and

a solid layer provided on the surface of the substrate and having an interface with air, said layer containing a photocatalyst and adapted to increase the hydrogen bond component,  $\gamma_s^h$ , in the surface energy at said interface in response to the photoexcitation of said photocatalyst.


63. A composite with a hydrophilifiable surface, comprising:

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a substrate;

a solid layer provided on the surface of the substrate and having an interface with air, said layer containing a photocatalyst and adapted to increase the hydrogen bond component,  $\gamma_s^h$ , in the surface energy at said interface in response to photoexcitation of said photocatalyst; and

a layer of molecules of water physically adsorbed onto the surface of said layer containing a photocatalyst in response to the photoexcitation of the photocatalyst.



64. A composite with a surface adapted to be rendered oil repellent in water, comprising:

a substrate;

a solid layer provided on the surface of the substrate and having an interface with air, said layer containing a photocatalyst and adapted to increase the hydrogen bond component,  $\gamma_s^h$ , in the surface energy at said interface in response to photoexcitation of said photocatalyst, thereby increasing the oil repellency of the surface of the composite in water.

65. A composite with an easily cleanable surface, comprising:

a substrate; and

a solid layer provided on the surface of the substrate and having an interface with air, said layer containing a photocatalyst,